

Rev 09/09

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application : Jans Roosjen  
Application No. : 10/565,375  
Filed : June 20, 2006  
Confirmation No. : 2169  
For : PROCESSING OF TEFF FLOUR  
Examiner : Jyoti Chawla  
Attorney's Docket : VER-204XX

TC Art Unit: 1794

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DECLARATION UNDER 37 C.F.R. § 1.132

**Via Electronic Filing**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Johannes Turkensteen declare:

1. I hold a master degree in business management as well as a degree in Informatics from the university of Groningen. I acquired my business master degree in the year 1975 and my informatics degree in the year 1978.

2. I have been working in the field of nutrition for more than 8 years now. Furthermore, I am also a consultant which is

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working and has worked for different companies, like Gasunie, and the Dutch Ministry of Agriculture and Environment.

3. I am presently Managing Director of Port V.O.F., the Applicant in the subject application. During 2002 until august 2009 I was also Managing Director of the Dutch companies HPFI bv, Soil and Crop, owning 50% of the shares of Eragrain and owning 60% of the shares of Teff bv, where my duties included day-to-day management and overseeing marketing and research efforts.

4. I am familiar with the contents of U.S. Patent Application No. 10/565,375, including the specification, drawings and preliminary amendment accorded a filing date of June 20, 2006.

5. I am familiar with the contents of the Office Action dated March 16, 2010, in which the Examiner states that "Kindie teaches a flour of a grain belonging to the Genus Eragrostis (such as Teff flour), but does not disclose that 'the falling number of the grain at the moment of grinding is at least 250.' Haarasilta discloses that a specific falling number range of a given flour may be chosen (or optimized) depending on the production process variables (such as process duration or process temperature) for a

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chosen end product." The Examiner further notes that a falling number of a minimum of 300 is evidenced by NPL reference Teff bv and that Teff grain can be applied to products where regular grain flours are used, such as beer, pasta, batters and soft drinks, as evidenced by NPL reference Eragrain Teff.


It should first be noted that the cited references of Eragrain Teff, Teff bv and Teff-Nutritional Data (also referred to as Teff Uncooked) are all derived from the inventor or from the Applicant of the present application, and were published after the filing date accorded the present application. In particular, the reference cited as Eragrain Teff is published by the company Eragrain, a company owned 50% by the Applicant. The reference cited as Teff bv is published by Teff bv, a Dutch company, and was published after the filing date accorded the present application. Teff bv is 60% owned by the present Applicant. The reference cited as Teff-Nutrition Data derives its published information from the inventor named in the present application, and is published after the filing date accorded the present application.

In each of these non-patent literature references, the published information is provided after the filing date accorded the present application, and is drawn from either the inventor or the Applicant of the present application. Accordingly, Eragrain

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Teff, Teff bv and Teff-Nutrition Data should not be usable as evidence against the invention recited in the claims of the present application. The information provided in these non-patent literature references does not reflect inherent characteristics of Teff flour prior to the present invention, since the inventive Teff flour did not exist prior to the present invention.

The genus *Eragostis* (to which Teff grain belongs) is significantly different in characteristics and qualities in comparison with other well known grains, including rye or other gluten-containing grain as discussed in Haarasilta. While Teff has been known and used to make Injera bread and beer for over 5,500 years, the qualities and characteristics of Teff traditionally have been unsuitable for baking. Typically, prior to the invention claimed in the present application, Teff flour was unusable for general baking purposes, since such attempts at baking using Teff flour resulted in green colored and very dense baked goods that were unsatisfactory or unpalatable with respect to taste or texture. If a skilled baker was given Teff flour and asked to produce a baked good such as bread, the result would be a low quality product in the form of a dense block that would be unsuitable for consumption in terms of taste or texture, and undesirable as a baked good. Prior to the invention in the



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present application it was unknown to utilize Teff flour to produce high quality baked goods, or to use Teff for purposes other than making Injera bread (non-leavened, pancake-like bread) or beer. The lack of knowledge to produce Teff flour suitable for making high quality baked goods persisted even though the nutritional and gluten-free virtues of Teff flour have been recognized as highly desirable.


With the present invention, a great deal of effort has been undertaken by myself, the inventor and by the companies in which the Applicant has a controlling interest, to determine if Teff flour could be usable to produce satisfactory baked goods. In the course of our investigation, different varieties and strains of Teff were cultivated and tested for baking properties. For example, different varieties of Teff grown in different geographical locations, such as Ethiopia, the United States (Hawaii, Idaho and Minnesota) and The Netherlands, were tested to determine if any varieties produced better quality baked goods among the different varieties in the different geographical locations. Varieties of Teff that were found to have better baking qualities than other varieties of those tested were examined in detail to determine the properties that would lead to better quality baked goods. For example, parameters such as



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growing season, moisture content, e.g., amount of rain or watering, nitrogen, number of stalks and falling numbers were all examined for the different varieties to determine if any of these factors could lead to the production of Teff flour with better baking qualities. After examining approximately 360 different varieties, it was found that certain Teff varieties that were exposed to a growing season with a particular amount of rainfall, and the resulting falling number, could lead to the production of Teff flour with suitable properties for producing high quality baked goods. The Teff varieties discovered to be more successful for baking purposes were cultivated to increase the moisture content and falling number, leading to Teff grain in accordance with the presently claimed invention. Prior to this extensive investigation, Teff flour was known to have a low falling number, on the order of 140-180, and it was not known that Teff flour could be used to produce high quality baked goods, or that there was any way Teff could be cultivated to permit the production of Teff flour suitable for use in producing high quality baked goods.

It appears that the Examiner likens the falling number of other types of flours, such as rye flour, to that of Teff flour. However, falling numbers for flours that contain gluten do not equate to falling numbers for Teff, which is gluten free, in terms



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of baking quality. Baking with flour containing gluten produces very different results from baking with flours that are gluten free. Typically, in a baking process, proteins, which includes gluten, help to maintain the shape and texture of an "expanded" baked product, i.e., a product with dough that expands or "rises" during the baking process. Starches contained in a flour used to make a baked good tend to stretch to make a baked good expand to be airier and lighter and less dense. Proteins such as gluten tend to keep the starches in their stretched form during the baking process. Because Teff is gluten-free, and tends to have smaller starch chains, baked goods produced from Teff flour prior to the present invention tended not to expand or to become airy, and instead resulted in a dense product when the protein content of the Teff flour was below a certain percentage, i.e., a low falling number. For example, if the falling number described in Haarasilta as applicable to rye flour was applied to Teff flour, the result would be a low quality product in the form of a dense block that would be undesirable as a baked product.

By determining that the falling number, i.e., the protein content, as well as the fine milling process, had an impact on the baked product quality, it became possible to produce high quality baked goods, where such a result was not possible, or known prior

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to the invention claimed in the present application. With regard to deriving an improved falling number, it has been determined through the extensive experimentation undertaken in this matter that the water provided to the Teff grain during the growing season can contribute to controlling the resultant falling number of the Teff flour. With respect to after-ripening, it was discovered that the falling number of harvested Teff can greatly increase within 2-6 weeks following harvest, in some cases even doubling. This result is significantly different from that experienced with other grains, including wheat. For example, in the case of wheat, the falling number at the moment of harvest increases slightly with after-ripening, and then becomes stable. Prior to the invention claimed in the present application, after-ripening of Teff still did not produce a sufficient falling number for a flour that could be used to produce baked goods, since the beginning falling number of the harvested Teff was far too low. Indeed, Injera bread has traditionally been made using Teff flour with a low falling number. Wheat flour or other flours are typically mixed with Teff to make Injera bread, and fermentation of the batter is used to attempt to improve the baking quality.


The fine milling of the Teff flour in accordance with the present invention permits the starches to react with moisture in



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the dough to permit the starch chains to stretch and combine with each other to produce sufficiently long starch chains to permit the dough to rise and become airy during cooking, which state can be maintained due to the protein content in the Teff flour having the specified novel and elevated falling number to produce a high quality baked product. If the Teff flour is not finely enough milled to permit the starches to combine with moisture in the dough properly, the effect of rising to produce an airy product during baking is inhibited. Accordingly, the combination of fine milling and specified falling number can work in conjunction in a Teff flour to produce a high quality baked product.

In summary, Teff flour produced prior to the present invention had a significantly lower falling number, which was a parameter that was not known to contribute to baking quality for baked goods made using Teff flour. Extensive research has been undertaken in the preparation of the present invention to determine the factors and specific parameter values that can produce a Teff flour that is suitable for producing high quality baked goods. While certain falling number levels are known to be usable in the case of flours containing gluten to produce high quality baked goods, such numbers do not directly translate to falling numbers of flours that are gluten free, such as Teff



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flour. By recognizing the useful range of falling numbers of Teff flour, and the factors that contribute to such falling numbers, in conjunction with a finely milled flour particle size, the present invention creates a novel and unobvious usability of Teff flour for producing high quality baked goods.

I hereby declare that all statements made herein on personal knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 22 day of July, 2010.

By Johannes Turkensteen



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